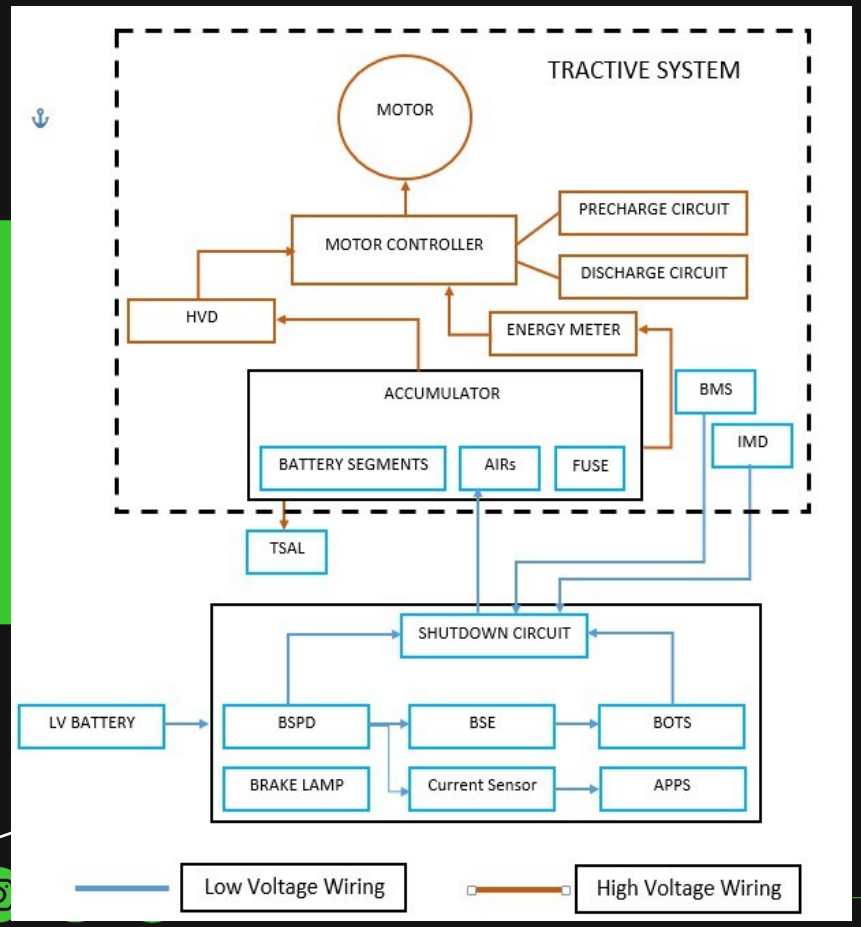
anargya

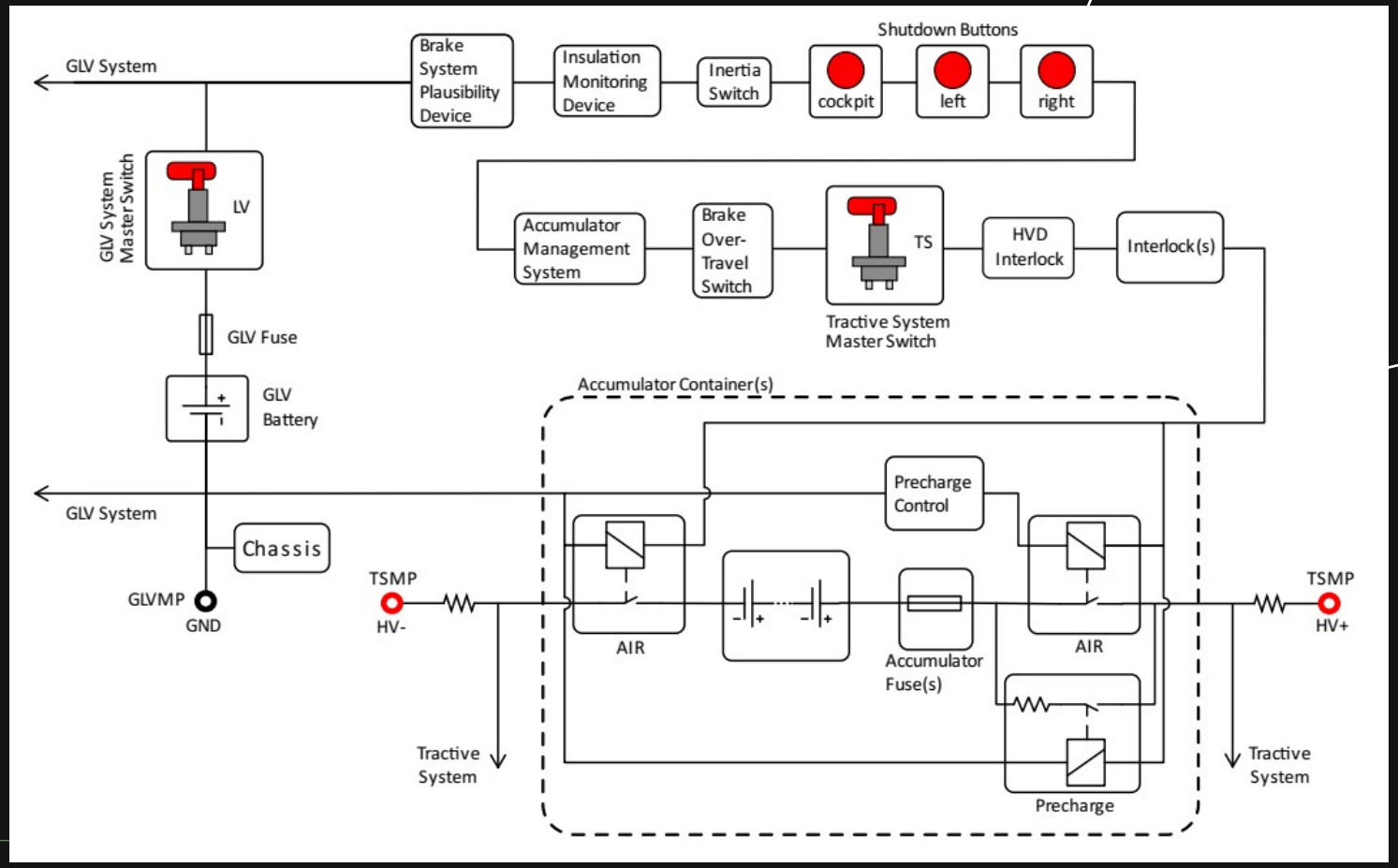
Electrical Wiring
&
Additional Component

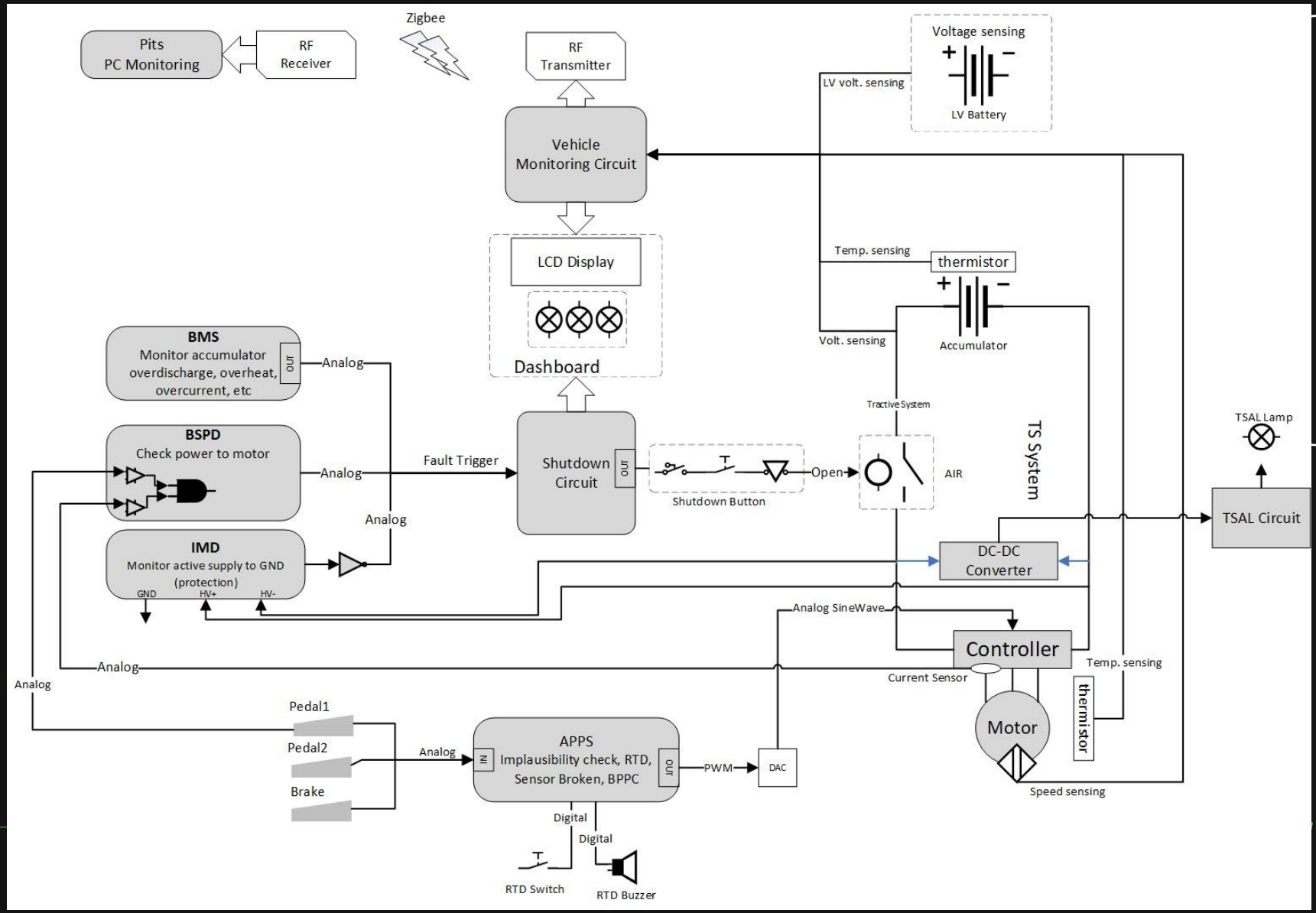
Overview

- System block diagram
- Wiring diagram
- Enclosure and part location
- Component selection

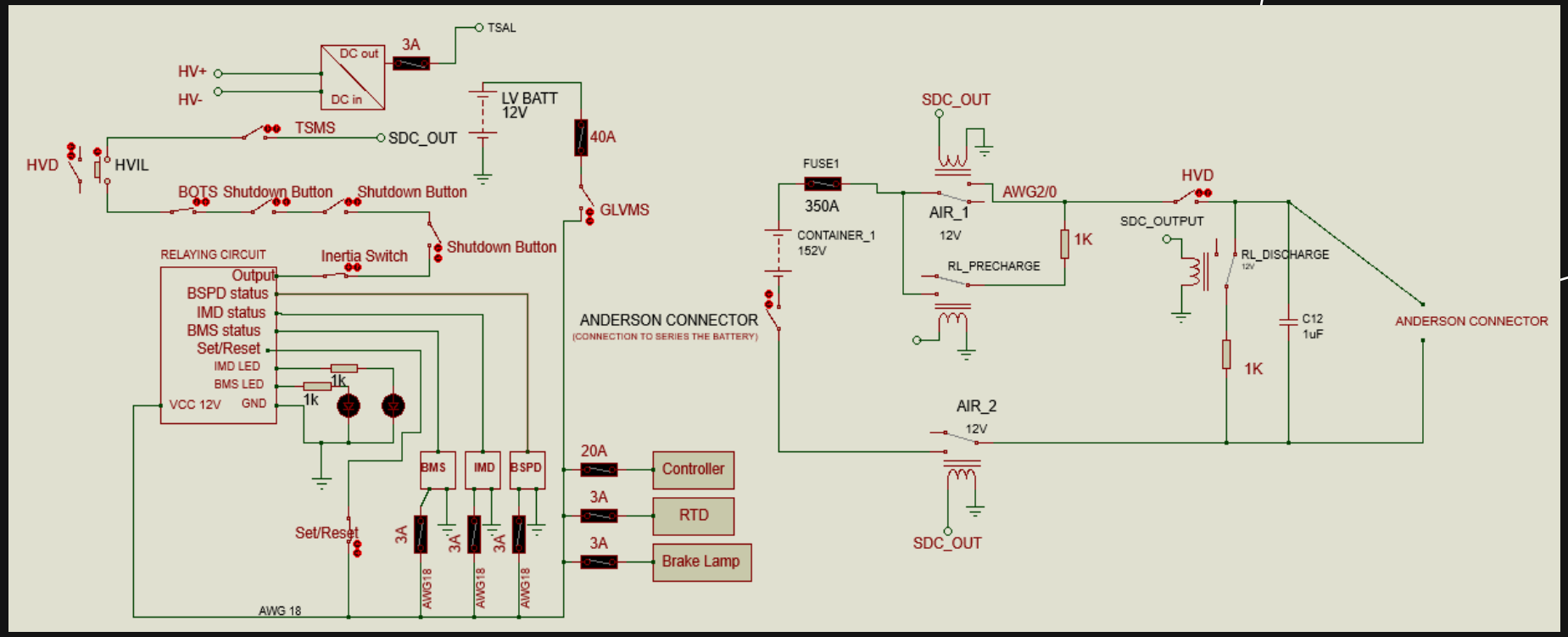
System Block Diagram






Zigbee
Pits
PC Monitoring
RF
Receiver
RF
Transmitter
Voltage sensing
LV volt. sensing
LV Battery
Vehicle
Monitoring Circuit
LCD Display
Dashboard
Temp. sensing
thermistor
Volt. sensing
Accumulator
BMS
Monitor accumulator
overdischarge, overheat,
overcurrent, etc
OUT
Analog
BSPD
Check power to motor
Analog
Fault Trigger
Shutdown
Circuit
OUT
Shutdown Button
Open
AIR
TS System
TSAL Lamp
TSAL Circuit
Analog
IMD
Monitor active supply to GND
(protection)
GND
HV+
HV-
DC-DC
Converter
Analog SineWave
Controller
Analog
Analog
Current Sensor
Temp. sensing
Pedal1
Pedal2
Brake
Analog
APPS
Implausibility check, RTD,
Sensor Broken, BPPC
IN
OUT
PWM
DAC
Motor
thermistor
Speed sensing
Digital
Digital
RTD Switch
RTD Buzzer

Wiring Diagram



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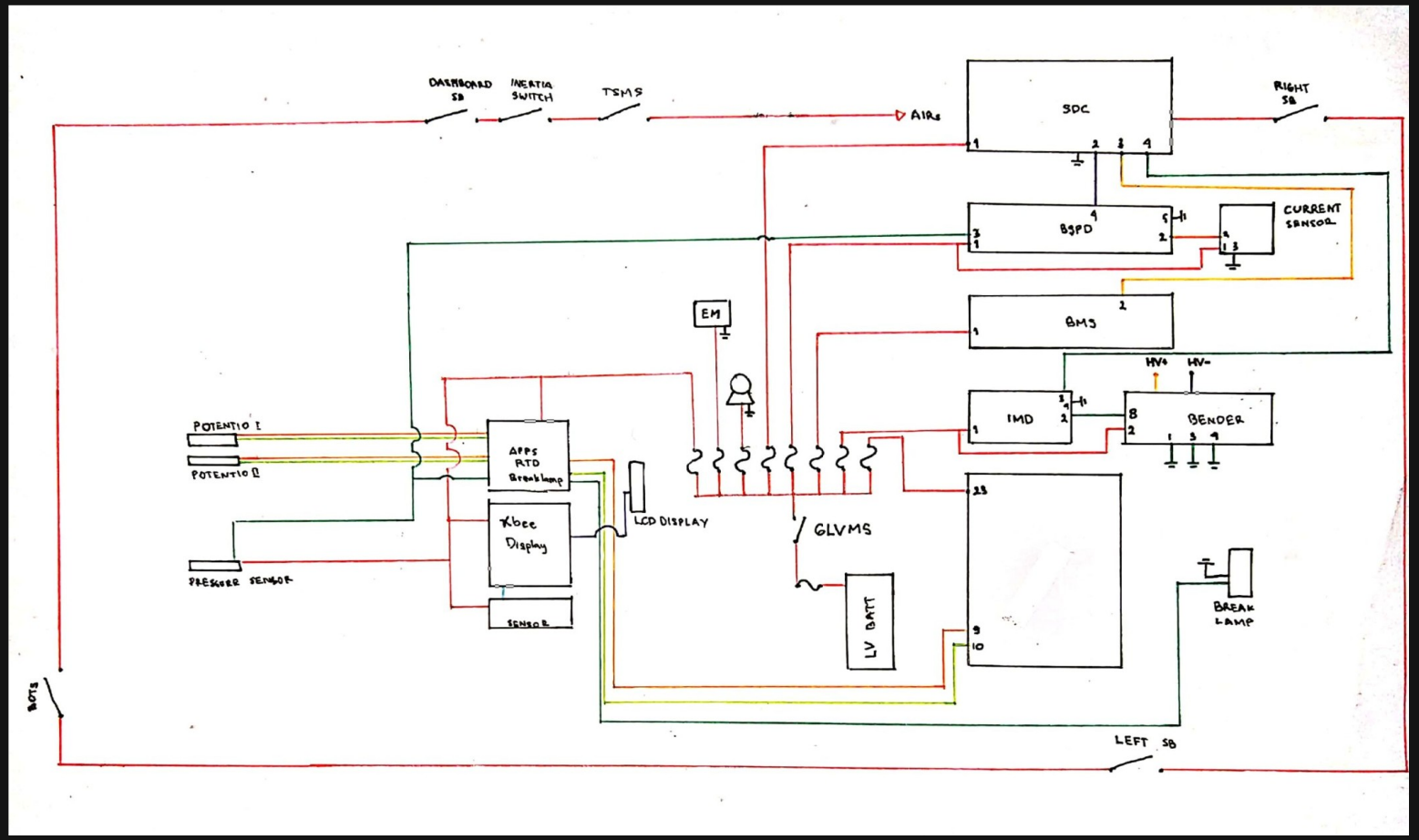
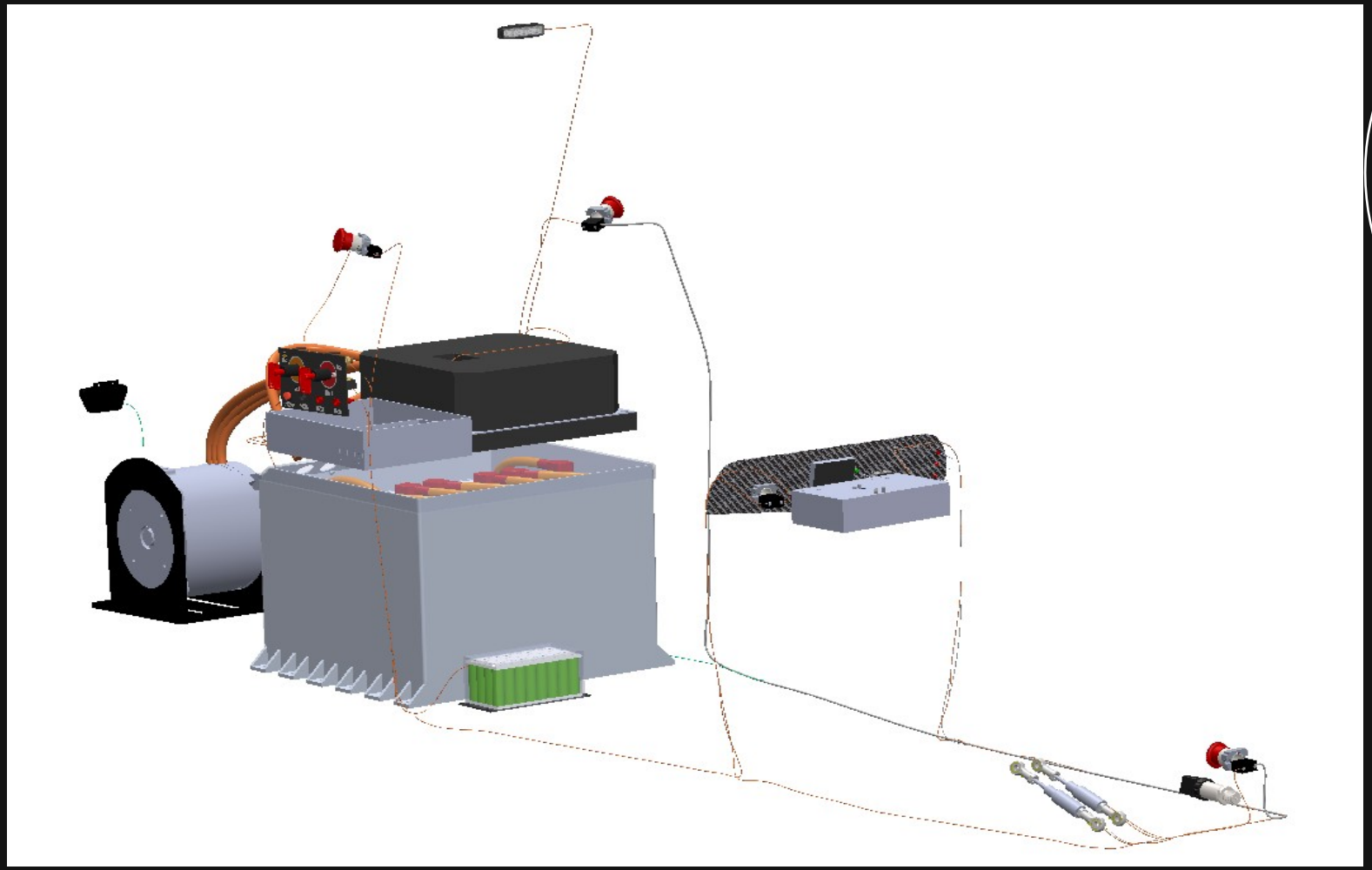

DASHBOARD SD
INERTIA SWITCH
TSMS
AIRs
SDC
RIGHT SB
BSPD
CURRENT SENSOR
BMS
EM
HV+
HV-
IMD
BENDER
POTENTIO I
POTENTIO II
APPS
RTD
Breaklamp
Xbee
Display
LCD DISPLAY
GLVMS
LV BATT
PRESSURE SENSOR
SENSOR
BOTS
BREAK LAMP
LEFT SB

Wiring Path



Switching

Master Switch

Push Stop Button

Toggle Switch

Push Button

Inertia Switch

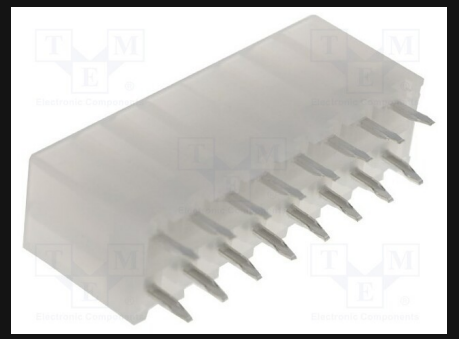
Rotary Switch

AIR

Wiring Equipment

Waterproof connector

Ringlug & skun



PCB-to-cable connector

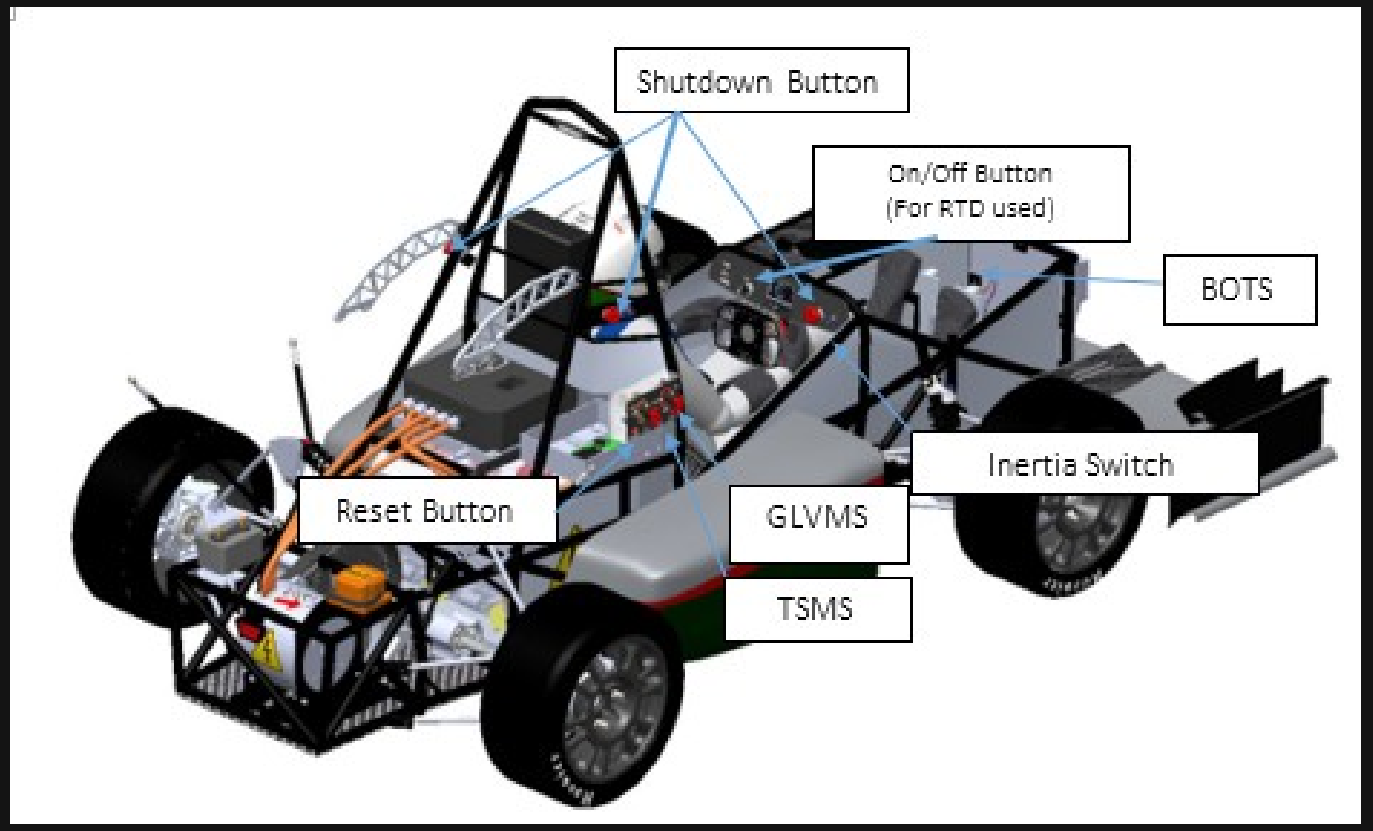
Conduit

Cable glands

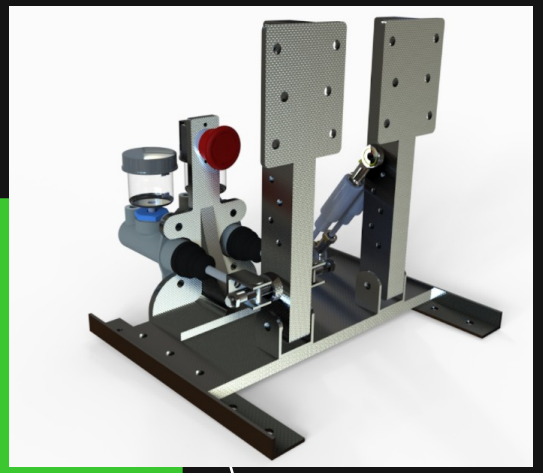
Cable-to-cable connector

Heat shrink

Switch Location



Pedalling System & other Sensor

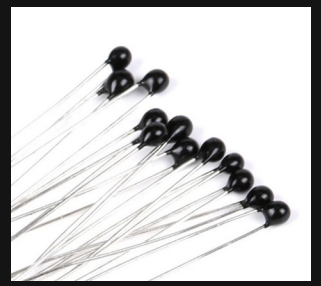


Pressure Sensor

Linear Potentiometer

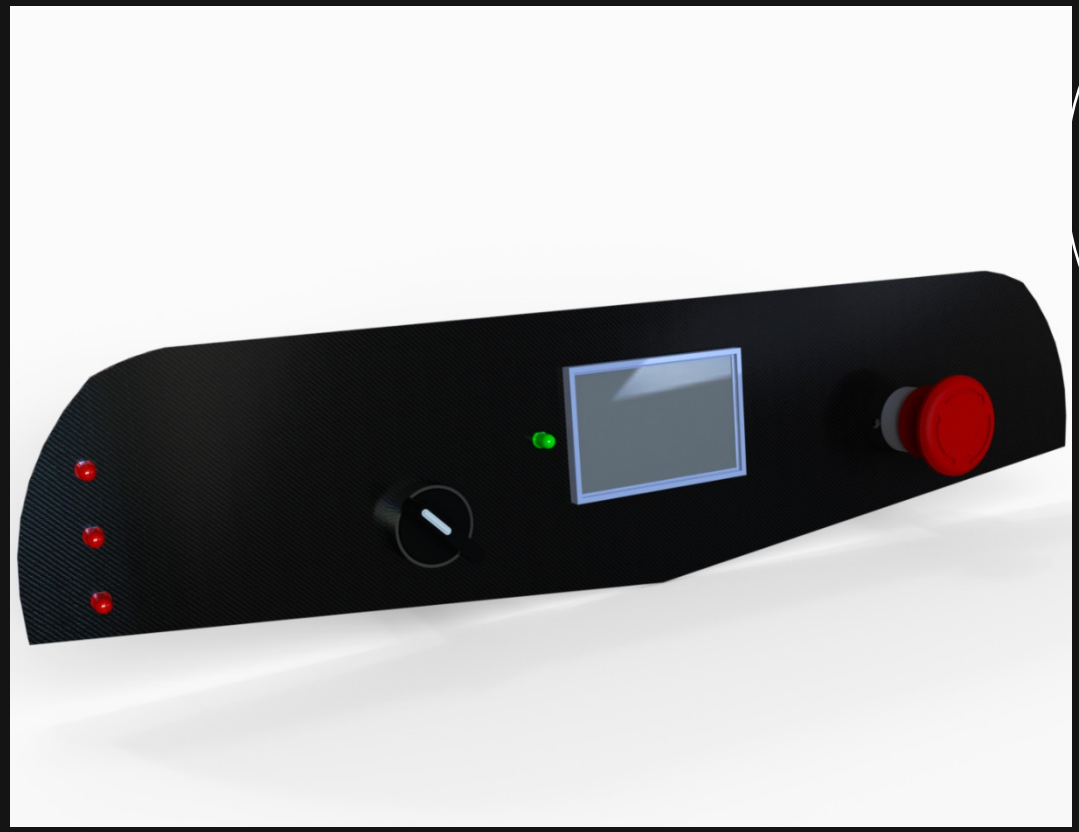
Current Sensor

Proximity Sensor



NTC Thermistor

Dashboard



SDC Normal Condition

Part	State Condition
GLVMS	NO
TSMS	NO
BOTS	NC
Shutdown Button	NC
Inertia Switch	NC
Safety Interlock	NC

LV BOX Belakang (Analog)

LV BOX Depan (Digital)

Fuse Selection

Purpose:

- Protect components, equipment and people from risk of fire and electric shock
- Isolate sub systems from the main system.

Overcurrent occurred when:

- Overload - simply drawing excessive current beyond the designed capacity of the circuit,
- Short-circuit, or fault current.

Selection process:

- Calculate/measure current supply to circuit
- Determine rated current being used
- Determine fuse max. current

Note: fuse breakpoint = 1.35 x rated current. Choosing fuse type is important, depend on fuse placement

Fuse

Cartridge/glass fuse

Blade fuse

Part	Current Rating	Voltage Rating
SDC	20A	12V
IMD	3A	12V
TSAL	3A	12V
BSPD	3A	12V
BMS	3A	12V
Controller Motor	40A	12V
Pump 1	5A	12V
Pump 2	5A	12V
Radiator	5A	12V
Fan Accumulator	15A	12V
Front Arduino	3A	12V
Brakelamp	3A	12V

Cable Selection

AWG gauge	Diameter Inches	Diameter mm	Ohms per 1000 ft	Ohms per km	Max amps for chassis wiring	Max amps for power transmission
OOOO	0.4600	11.6840	0.0490	0.160720	380	302
OOO	0.4096	10.40384	0.0618	0.202704	328	239
OO	0.3648	9.26592	0.0779	0.255512	283	190
0	0.3249	8.25246	0.0983	0.322424	245	150
1	0.2893	7.34822	0.1239	0.406392	211	119
2	0.2576	6.54304	0.1563	0.512664	181	94
3	0.2294	5.82676	0.1970	0.646160	158	75
4	0.2043	5.18922	0.2485	0.815080	135	60
5	0.1819	4.62026	0.3133	1.027624	118	47
6	0.1620	4.11480	0.3951	1.295928	101	37
7	0.1443	3.66522	0.4982	1.634096	89	30
8	0.1285	3.26390	0.6282	2.060496	73	24
9	0.1144	2.90576	0.7921	2.598088	64	19
10	0.1019	2.58826	0.9989	3.276392	55	15
11	0.0907	2.30378	1.2600	4.132800	47	12
12	0.0808	2.05232	1.5880	5.208640	41	9.3
13	0.0720	1.82880	2.0030	6.569840	35	7.4
14	0.0641	1.62814	2.5250	8.282000	32	5.9
15	0.0571	1.45034	3.1840	10.44352	28	4.7
16	0.0508	1.29032	4.0160	13.17248	22	3.7
17	0.0453	1.15062	5.0640	16.60992	19	2.9
18	0.0403	1.02362	6.3850	20.94280	16	2.3

Conductor Location	Size	Voltage Rating	Ampacity	Rating of fuse providing protection	Temperature Rating	Datasheet
Container to HVD, inverter, and phase cable	AWG 2/0	600 V	250 A	250 A	90°C	Datasheet
IMD	AWG 18	600 V	7.5 A	3 A	150°C	Datasheet
TSAL	AWG 18	600 V	7.5 A	3 A	150°C	Datasheet
BMS	AWG 18	600 V	7.5 A	3 A	150°C	Datasheet
Shutdown Circuit	AWG 18	600 V	7.5 A	10 A	150°C	Datasheet
APPS	AWG 18	600 V	7.5 A	1 A	150°C	Datasheet
BSPD	AWG 18	600 V	7.5 A	1 A	150°C	Datasheet
AIR	AWG 2/0	600 V	250 A	250 A	90°C	Datasheet
HVD	AWG 2/0	600 V	250 A	250 A	90°C	Datasheet
Busbars – Connected to Cell modules	130 mm^2	N/A	N/A	N/A	N/A	N/A

LV Battery

Seri: LG 18650 MJ1

- Configuration: 4 series & 13 paralel, 4s13p
- Capacity: 13x@3.5Ah=45.5Ah (nominal)
- Voltage: 4x@3.635V=14.54V (nominal)
- Discharge: 13x@0.68A=8.84A (standart) dan 13x@10A=130A (burst)

- Charge:
- 13x@1.7A=22.1A (standart)
- 4x@4.2V=16.8V (standart)

Good Luck